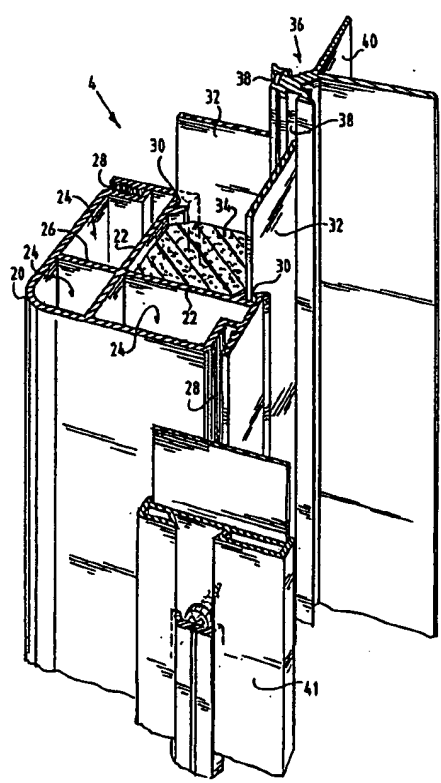


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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/NL98/00516 <b>(22) International Filing Date:</b> 8 September 1998 (08.09.98) <b>(30) Priority Data:</b> 1006974 8 September 1997 (08.09.97) NL <b>(71) Applicant (for all designated States except US):</b> HOLLAND HEATING B.V. [NL/NL]; Zanddonkweg 1, NL-5144 NX Waalwijk (NL). <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> VAN BENTHEM, Marinus, Johannes, Antonius [NL/NL]; Schimmelpennincklaan 15, NL-4871 GC Etten-Leur (NL). BLEIJS, Philippus, Johannes, Maria [NL/NL]; Kinderdijkstraat 24, NL-5045 PC Tilburg (NL). <b>(74) Agent:</b> LAND, Addick, Adrianus, Gosling; Arnold & Siedsma, Sweelinckplein 1, NL-2517 GK The Hague (NL).		<b>(81) Designated States:</b> AU, CN, KR, SG, SK, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> ASSEMBLY FOR AN AIR CONDITIONING CABINET  <b>(57) Abstract</b> <p>Assembly of parts for mutually joining one or more panels of an air conditioning cabinet, the assembly (4) comprising: a wall (18) and one or more profile parts (32) joined to this wall which extend therefrom, which profile parts are joinable with a cabinet panel in such a way that the wall makes no contact with sides of the panel forming the inner wall of the air conditioning cabinet, wherein the wall and the profile parts (32) are chosen such that a low heat transfer coefficient is providable and such that condensation within and exterior to the cabinet is substantially avoidable.</p> 		

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**ASSEMBLY FOR AN AIR CONDITIONING CABINET**

The present invention relates to an assembly for the mutual coupling of panels of an air conditioning cabinet and to an air conditioning cabinet comprising such an assembly.

5           A disadvantage of known air conditioning cabinets such as that described in the European patent application No. 91201946.0 is that condensation can occur within such cabinets when these are used under humid conditions, such as exist in South East Asian countries.

10           An important object of the present invention is to substantially obviate this disadvantage.

The present invention accordingly provides an assembly of parts for mutually joining one or more panels of an air conditioning cabinet, the assembly comprising:

15           - a wall and  
            - one or more profile parts joined to this wall which extend therefrom, which profile parts are joinable with a cabinet panel in such a way that the wall makes no contact with sides of the panel forming the inner wall of  
20 the air conditioning cabinet, wherein the wall and the profile parts are chosen such that a low heat transfer coefficient is providable and such that condensation within and exterior to the cabinet is substantially avoidable.

25           With this assembly, there is a clear reduction in condensation in comparison with known air conditioning cabinets.

            Since the wall preferably comprises an inner wall part and an outer wall part with a spacing  
30 therebetween, insulation means which are preferably mounted between the wall and the profile part and whereby the wall and the profile part preferably have differing

heat transfer coefficients, the assembly functions as an effective cold bridge in order to prevent condensation in the cabinet. The wall can be substantially L-formed in shape and is preferably extruded from aluminium in order to be light in weight.

Since the assembly preferably serves in a frame of an air conditioning cabinet, the assembly is, in its assembled form, preferably square.

According to a second aspect of the present invention, there is provided an air conditioning cabinet, comprising the above connection assembly.

According to a third aspect of the present invention, there is provided a door for an air conditioning cabinet.

Further advantages, characteristics and details of the present invention will be clarified with respect to the specific description of preferred embodiments thereof, with reference to the accompanying figures, wherein:

figure 1 shows a perspective view of an air conditioning cabinet according to the present invention;

figure 2 shows a perspective view of the assembly according to the present invention;

figure 3 shows a perspective view of a corner of the cabinet from figure 1 as seen in the direction of arrow III;

figure 4 shows a perspective view of the corner from figures 1 and 3 as seen from the interior thereof;

figure 5 is a cross section over line V-V from figure 1;

figure 6 shows a cross section over line VI-VI from figure 1;

figure 7 shows a cross section over line VII-VII from figure 1;

figure 8 shows a perspective view of a second embodiment of an air conditioning cabinet;

figure 9 shows a cross section over line IX-IX from figure 8;

figure 10 shows a cross section of the column from figure 2; and

figures 11 and 12 are condensation graphs resulting from measurements taken from air conditioning cabinets wherein 1 and 2 are reference measurements obtained from known cabinets and wherein 3 refers to measurements obtained for the cabinet according to the present invention.

An air conditioning cabinet 1 (figure 1), wherein apparatus (not shown) such as a ventilator, filters, and possibly an air humidifier and the like are mounted, comprises panels 2, corner columns 4 and intermediate columns 6. An underframe 8 comprises continuous lying profiles. The cabinet 1 further comprises a door 10 mounted on the cabinet 1 by means of two hinges 12.

The corner columns 4 are mutually connected by means of corner points 14, as is also shown in figure 3.

The panel connecting assembly (columns) 4 is built up from an aluminium wall 18 with an outer wall part 20 and an inner wall part 22 (figure 2). These wall parts 20, 22 have a spacing 24 therebetween and are separated by means of four struts 26.

The wall 18 is L-shaped in cross section and is provided with screw canals 28 for securing screws.

The inner wall part 22 is provided with profile channels 30 for gripping plastic profiles 32 which extend from the wall 18 inwards in order to provide the columns 4 with a square form in cross section. Between the inner wall part 22 and these two plastic profiles 32 a polyurethane insulating foam 34 is provided.

These profiles 32 are also joined to an extended Y-shaped panel connection 36, provided with two locking channels 38 for locking the plastic profiles 32 into position.

Flanges 40 extend from this panel connection 36, these flanges which can be securely screwed to the air conditioning cabinet panels, as is shown in figure 5.

An aluminium cover strip 41 is screwed to the wall 18, in order to cover the connection between the columns 4 and subsequent cabinet panels.

The corner points 14 each have three extending leg parts 42 (figure 4), which are provided with recesses 44 for the wall struts 26, the legs 42 which pass in the spacing 24 of the columns 4 in order to join the columns 4 together (see figure 1).

The door 10 has an outer wall 50 and an inner wall 52, where between polyurethane foam 54 is mounted (figure 5).

An extended U-shaped connecting piece 56 connects the inner wall 52 with the outer wall 50 and also serves as a support for two rubber insulating door sealings 58.

The door 10 is mounted on the cabinet by means of hinges 12.

In order to join together two panels lying in the same plane, two columns 4 serve as an intermediate column 6 to be joined together by means of a joining plate 60 as shown in figure 6. Polyurethane foam 62 is provided between this joining plate 60 and the columns 4.

The underframe 8 (figure 7) is secured to the air conditioning cabinet by means of screws secured in a screw channel of a column 4.

Figure 8 shows an embodiment of the air conditioning cabinet with an overhanging lip 64 mounted on the upper side of the cabinet, which serves as protection, for example against rain and such like. This overhanging lip 64 is secured by means of screws to a panel and a column (see figure 9).

The cross section of the column 4 (figure 10) has the following dimension:

A = 11 mm	G = 1 mm	M = 32 mm
5 B = 10 mm	H = 1,5 mm x 45°	N = 20 mm
C = 62 ± 0,3 mm	I = 2 mm	O = 60 ± 0,3 mm
D = 5 mm	J = 1,8 mm	P = 30 mm
E = 3 mm	K = 10 mm	Q = 90 mm
F = 1 mm	L = 2 mm	

10

The inventors have measured the air conditioning cabinet according to the present invention, for both external and internal condensation under varying conditions, wherein figure 11 shows the level of external  
15 condensation and figure 12 the level of internal condensation of the air conditioning cabinet.

A number of other measured parameters of the air conditioning cabinet according to the present invention as measured by the inventors are as follows:

20

	W
Heat transfer coefficient	0,6 ———
	m <sup>2</sup> K
Thermal Bridging	0,87
25 Leaking air from the cabinet, standard	<0,003*p <sup>0,65</sup>

The invention is not limited to the above description, the requested rights are rather determined by the following claims.

## CLAIMS

1. Assembly of parts for mutually joining one or more panels of an air conditioning cabinet, the assembly comprising:

- a wall and
- 5       - one or more profile parts joined to this wall which extend therefrom, which profile parts are joinable with a cabinet panel in such a way that the wall makes no contact with sides of the panel forming the inner wall of the air conditioning cabinet, wherein the wall and the
- 10 profile parts are chosen such that a low heat transfer coefficient is providable and such that condensation within and exterior to the cabinet is substantially avoidable.

2. Assembly according to claim 1, wherein the

15 wall comprises an inner wall part and an outer wall part, with a spacing therebetween.

3. Assembly according to claims 1 or 2, wherein the wall is substantially L-shaped in cross section.

4. Assembly according to claim 3, which is

20 substantially square in cross section.

5. Assembly according to any of the previous claims, wherein the profile part extends from the wall to a connecting piece for connecting to an air conditioning cabinet panel.

25       6. Assembly according to any of the previous claims, further comprising insulating means, mounted between the wall and the profile part.

7. Assembly according to any of the previous claims, further comprising locking means for locking the

30 profile part to the wall.

8. Assembly according to any of the previous claims, further comprising a strengthening strut which

extends between the outer wall part and the inner wall part.

9. Assembly according to any of the previous claims, wherein the wall is extruded.

5 10. Assembly according to any of the previous claims, wherein the wall and the profile have differing heat transfer coefficients.

11. Assembly according to any of the previous claims, wherein the wall is made of aluminium.

10 12. Assembly according to any of the previous claims, wherein the profile is made of synthetic material, for example plastic.

13. Assembly according to any of the previous claims, wherein the insulating means comprise  
15 polyurethane foam.

14. Assembly according to any of the previous claims, wherein the connecting pieces are provided with locking means for locking the profile thereto.

15. Assembly according to claim 14, wherein the  
20 connecting pieces comprise one or more flanges which extend along the air conditioning cabinet panels.

16. Assembly according to any of the previous claims, wherein the outer wall part is provided with receiving means for receiving screws and the like.

25 17. Air conditioning cabinet comprising one or more of the assemblies according to any of the previous claims.

18. Air conditioning cabinet according to claim 17, whereby the assembly is mounted at each corner of the  
30 cabinet.

19. Air conditioning cabinet according to claims 17 or 18, further comprising:

- an underframe comprising one or more continuous, lying frame assemblies;

35 - one or more panels securable to the underframe and to which one or more of the frame parts are securable; and to which a subsequent panel is securable.

20. Air conditioning cabinet according to claim 19, further comprising a door, which in turn comprises:

- an outer wall,
- an inner wall,
- 5 - insulation means, mounted between these walls; and
- a rubber-like profile extending from the door to contact a cabinet panel when the door is closed, wherein the door is assembled such that a low heat
- 10 transfer coefficient is providable, so that condensation with and exterior to the cabinet is substantially avoidable.

21. Cabinet according to claim 20, further comprising securing means for securing the rubber-like

15 profile to the door.

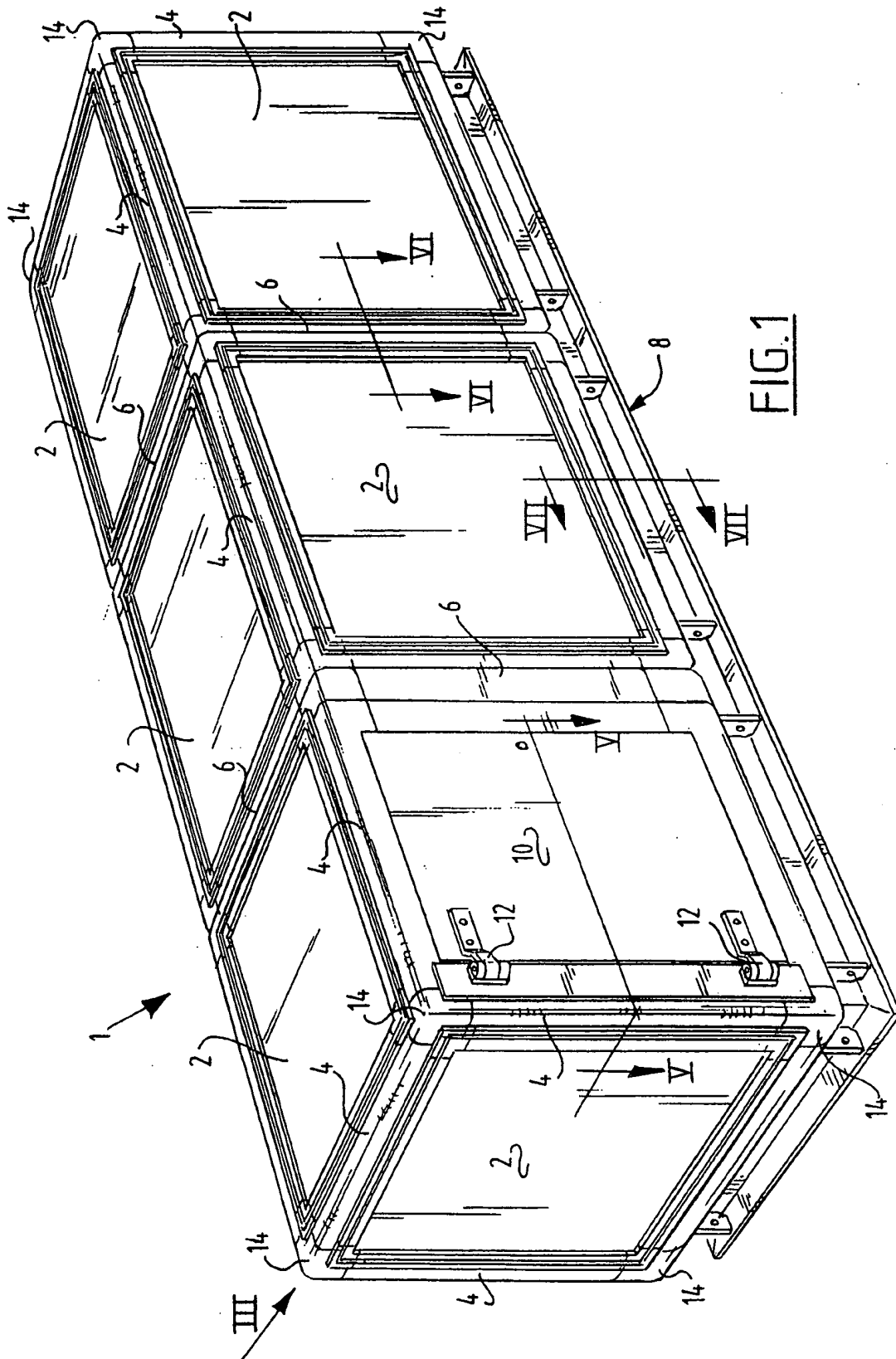
22. Cabinet according to claim 21, wherein the door has substantially the same thermal conductivity as the assembly according to any of the claims 1-16.

23. Cabinet according to claim 22, wherein the

20 door is mounted on the cabinet by means of a hinge.

24. Door for an air conditioning cabinet comprising:

- an outer door wall,
- an inner door wall,
- 25 - insulation means, mounted between these walls; and
- a rubber-like profile extending from the door to contact a cabinet panel when the door is closed, wherein the door is assembled such that a low heat
- 30 transfer coefficient is providable, so that condensation with and exterior to the cabinet is substantially avoidable.



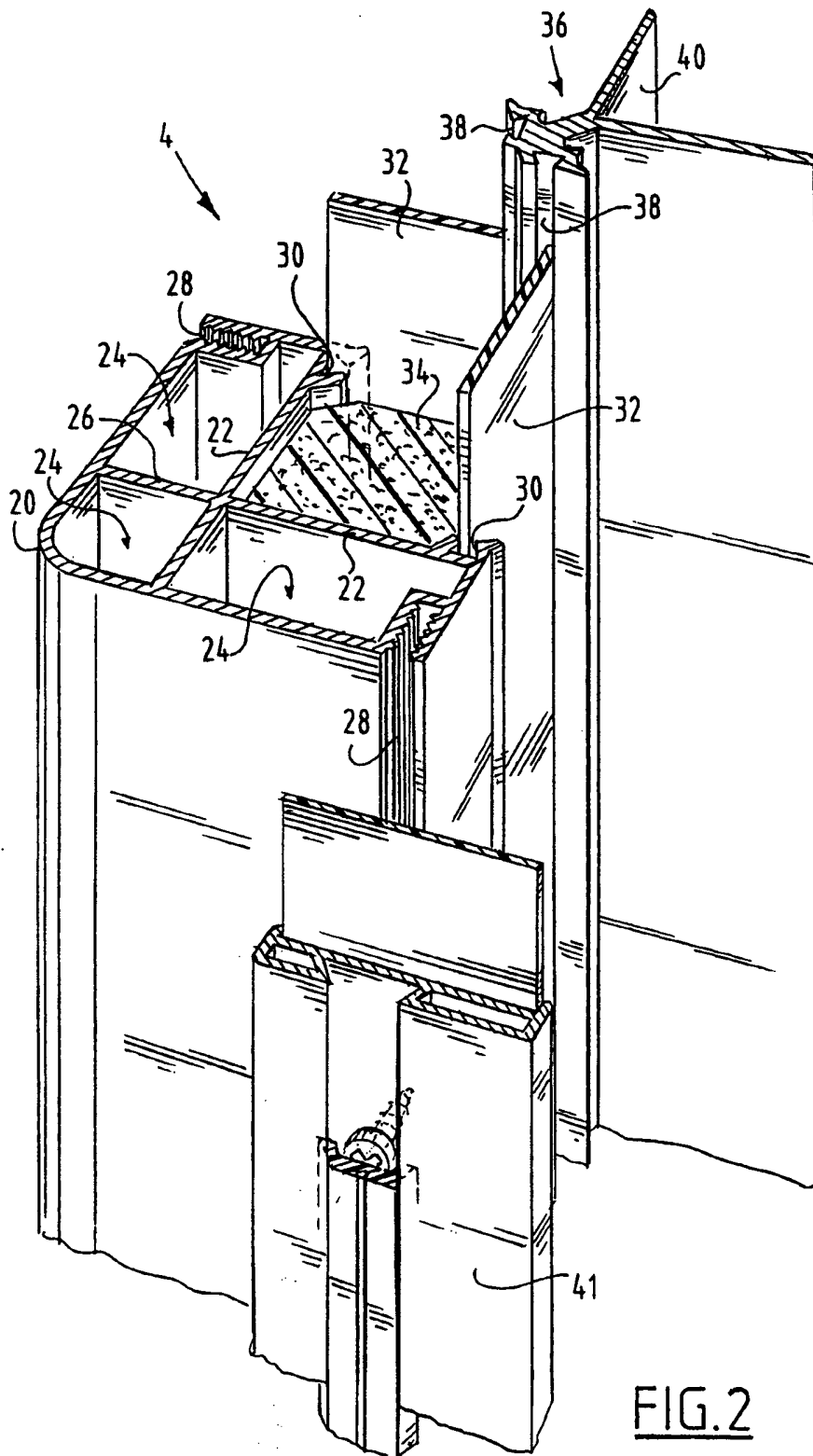


FIG. 2

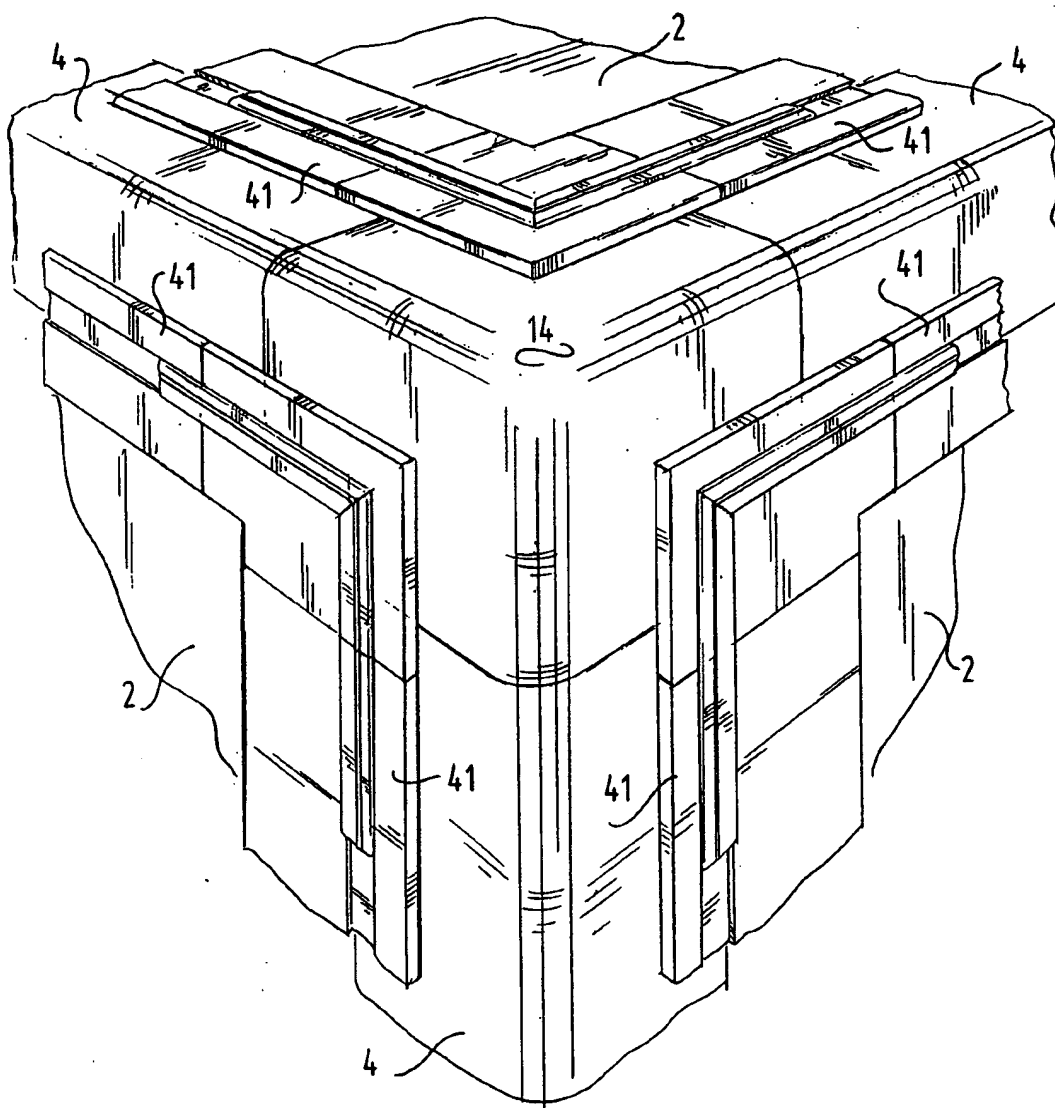
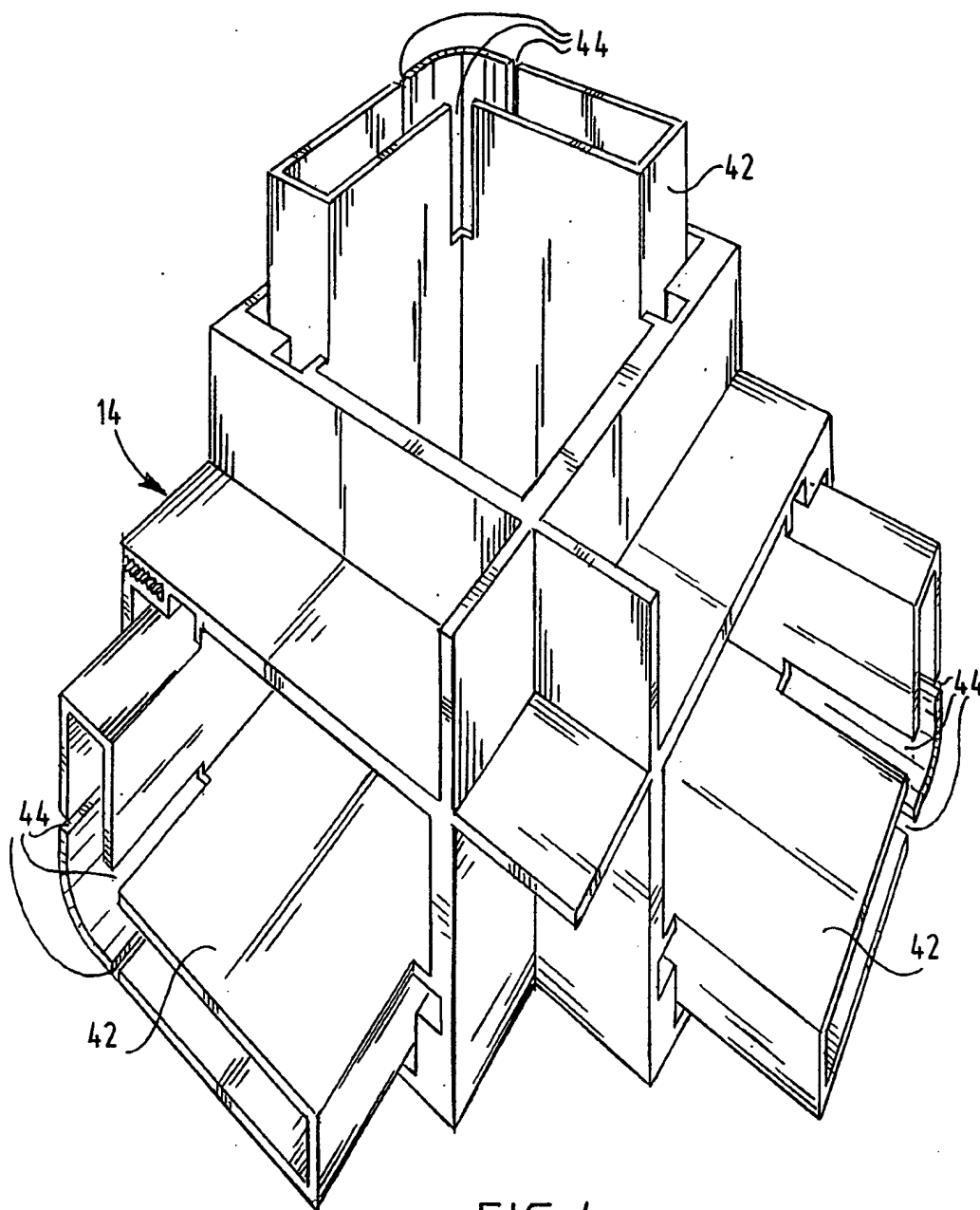


FIG. 3



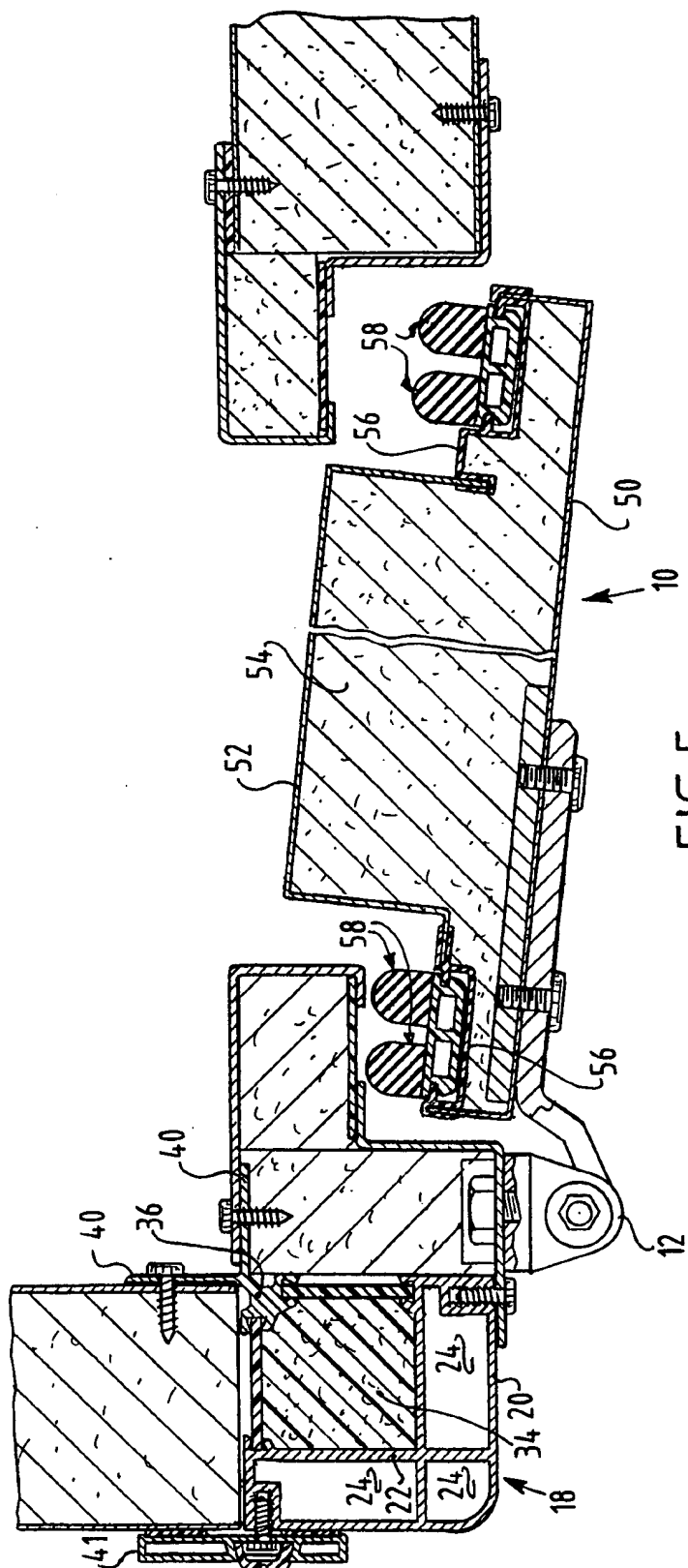


FIG. 5

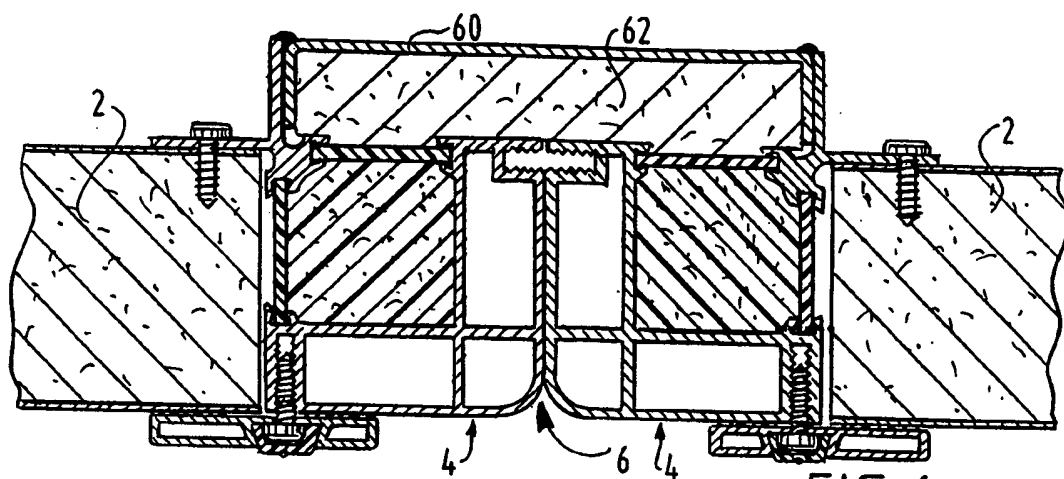


FIG. 6

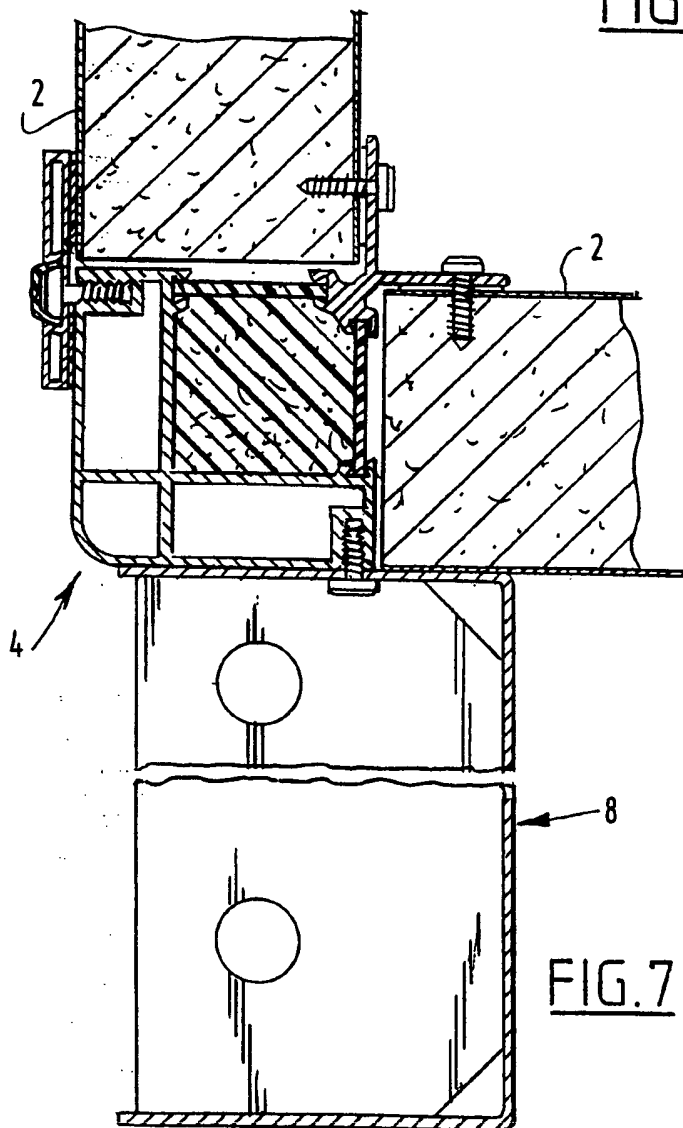
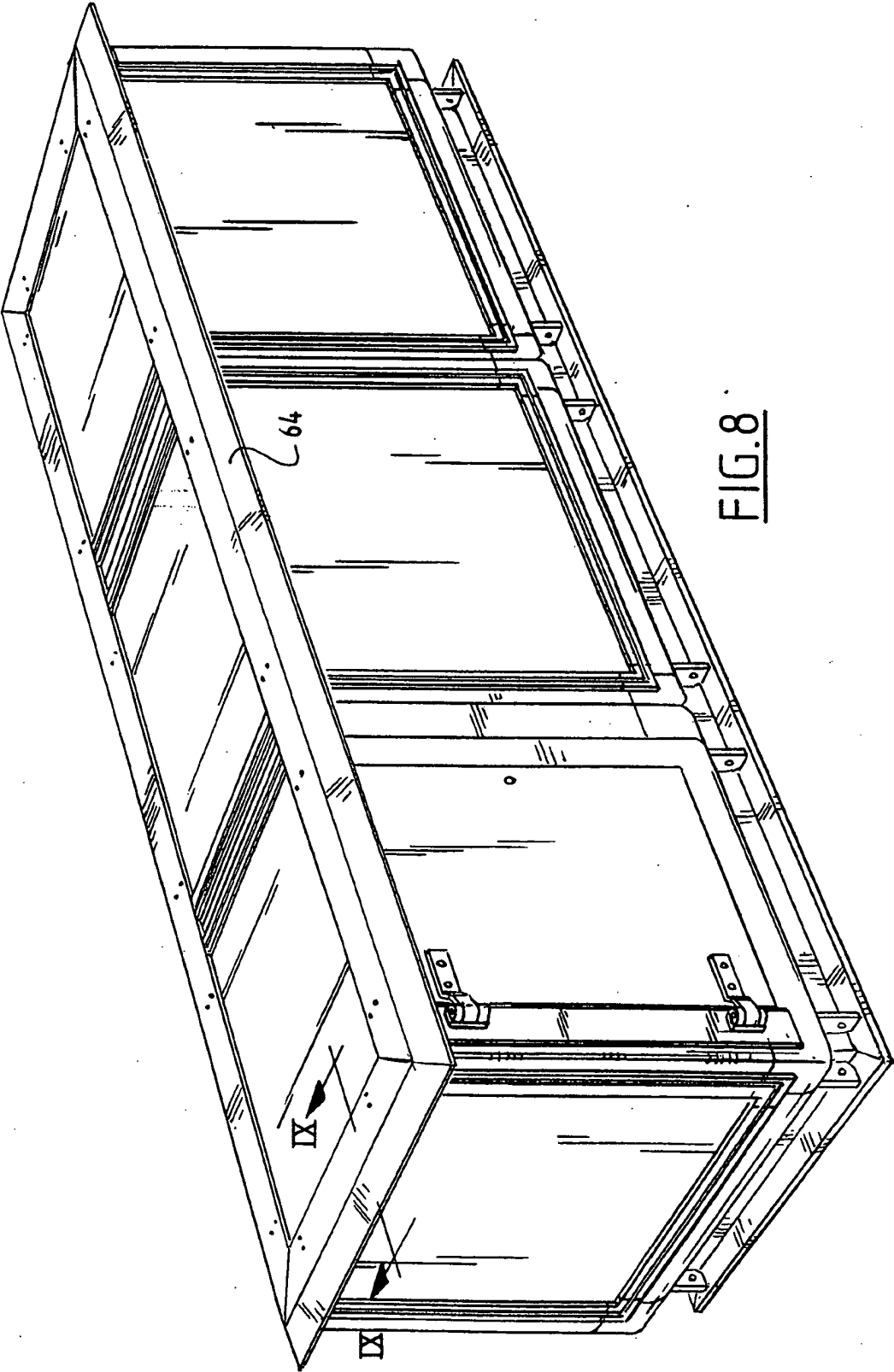


FIG. 7



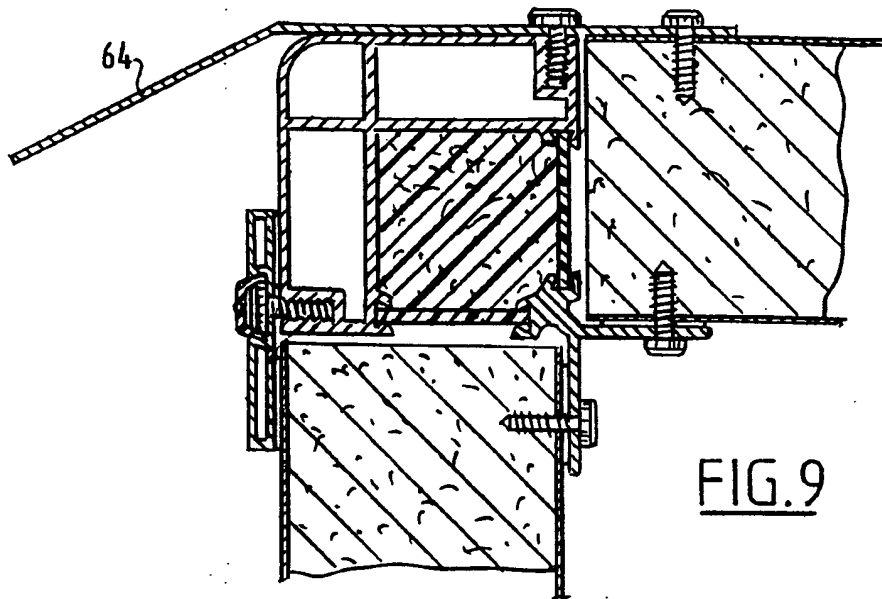


FIG. 9

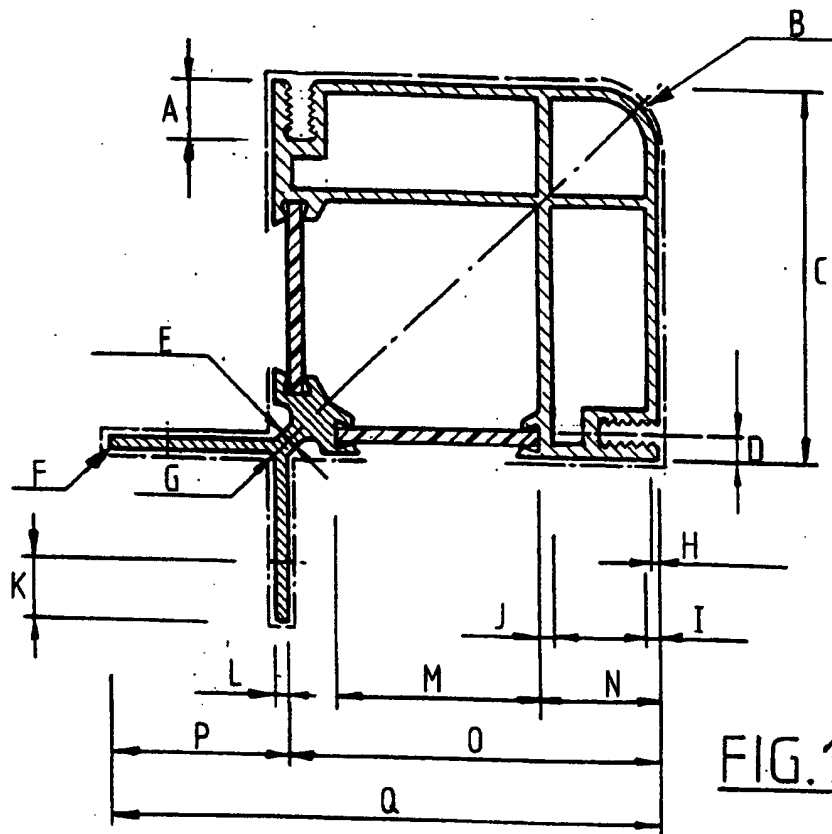


FIG. 10

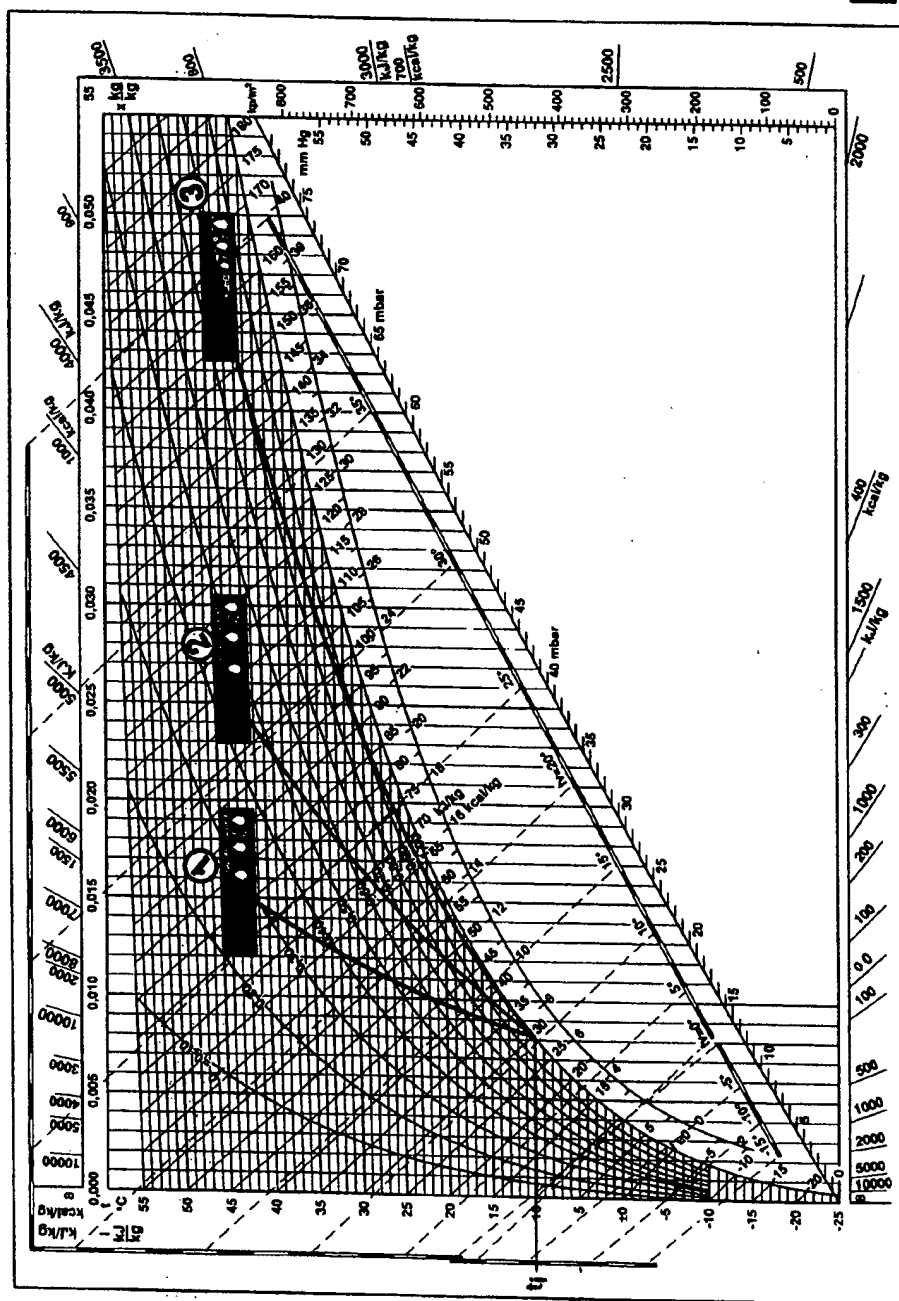


FIG. 11

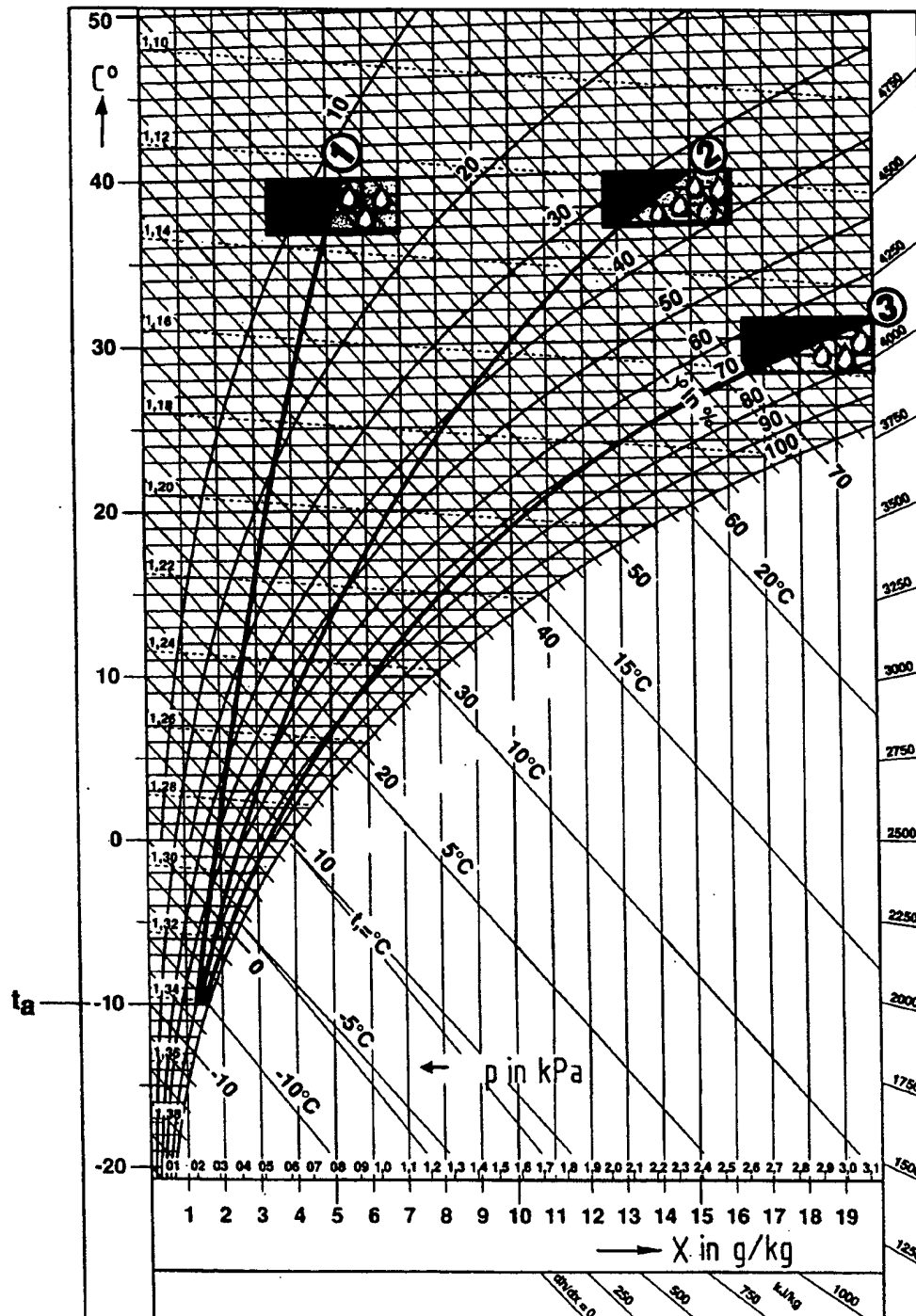


FIG.12

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 98/00516

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 F24F13/20 E04H1/12

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Minimum documentation searched (classification system followed by classification symbols)

IPC 6 F24F E04H

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 427 626 A (WESPER S A) 15 May 1991	1-3, 7-12, 16, 17
Y	see column 3, line 33 - column 5, line 30; figures 1,2	18,19
Y	EP 0 468 597 A (HOLLAND HEATING BV) 29 January 1992 cited in the application see figures	18,19
X	GB 2 264 165 A (EQUINE HOLDINGS LIMITED) 18 August 1993	24
A	see page 16, line 10 - page 17, line 2; claims 3-7; figures 13-16	20-23
	-/--	

☒ Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search

13 November 1998

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 92 17 801 U (HANSA VENTILATOREN, MASCHINENBAU NEUMANN) 8 April 1993  see page 6 - page 8; figures ---	1-7, 9-11, 13, 17
A	WO 94 24493 A (EMAIL LTD) 27 October 1994  see page 2, line 15 - page 5, line 18; figures ---	1-3, 5, 7, 8, 10, 16, 17, 19
A	US 3 527 011 A (BLOOM LESTER W ET AL) 8 September 1970 see figure 7 -----	1

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Information on patent family members

International Application No

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